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## SPECIFICATION

SELF-ERECTING STRUCTURE FOR ROD-SHAPED MEMBER AND METHOD OF PRODUCING ROD-SHAPED MEMBER HAVING SELF-ERECTING STRUCTURE

## 5 TECHNICAL FIELD

[0001] The present invention relates to a structure for allowing a rod-shaped member, e.g. a makeup brush, to erect automatically, and also pertains to a method of producing such a rod-shaped member.

## 10 BACKGROUND ART

[0002] When makeup brushes, for example, are stored in associated containers, they are generally accommodated side-by-side in accommodating portions of the containers in their lying position. Containers for accommodating makeup  
15 brushes, etc. tend to be made small and thin for carrying convenience. When using a makeup brush or the like, the user opens the lid of the associated container and picks up the desired brush or the like, which is in its lying position, with his or her fingers. On such an occasion,  
20 the user may undesirably drop a brush or the like accommodated in the container owing to vibration or other movement occurring when he or she opens the lid of the container. In a case where the rod-shaped member accommodated is a makeup brush or tip, if it drops onto the  
25 ground, the brush or tip may become unsanitary or unfit for use. If the rod-shaped member is fragile, it may break when dropped.

[0003] Under these circumstances, there has heretofore

been proposed in U.S. Patent No. 5,135,012 a structure in which a brush, for example, is provided with a magnet, and another magnet is provided on the container side to prevent the brush from undesirably dropping off the container by  
5 magnetic attraction force acting between the two magnets, thereby allowing the brush to be surely held in the container without employing a complicated structure, e.g. a fastening device.

Patent Document 1: U.S. Patent No. 5,135,012

10 DISCLOSURE OF THE INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0004] Brushes or the like are, however, of various shapes and sizes. Therefore, there are cases where it is difficult for the user to hold a brush or the like with his  
15 or her hand. When the container is small in size and thin in conformity to the configuration of brushes or the like, it may also be difficult to hold a desired brush or the like with the hand. When used in a narrow place, a brush or the like may be difficult to take out of the associated  
20 container even if the container is sufficiently large in size. Further, a structure that holds a brush or the like in a container by using magnetic force, as proposed in the above-described U.S. Patent No. 5,135,012, may make it rather difficult to take out the brush or the like from the  
25 container.

[0005] Accordingly, an object of the present invention is to provide a self-erecting structure for a rod-shaped member, e.g. a brush, which enables the rod-shaped member

to be readily taken out from an associated container while satisfying the demand that the rod-shaped member should be prevented from easily dropping from the container, and also provide a method capable of readily producing a rod-shaped member having such a structure.

#### MEANS FOR SOLVING THE PROBLEM

[0006] To attain the above-described object, a first aspect of the present invention provides a self-erecting structure for a rod-shaped member including a rod-shaped member having a rod part with one end and the other end and an erecting operation part provided at the one end of the rod part. The self-erecting structure further includes a container having a mount surface capable of accommodating the rod-shaped member in a lying position. The mount surface has an erecting action surface for the erecting operation part of the rod-shaped member to perform an erecting action thereon. The container further has a lid capable of opening and closing an open part of the mount surface. The erecting operation part of the rod-shaped member has a rolling surface rollable on the erecting action surface in the erecting direction of the rod-shaped member. An erection support surface is formed adjacent to and forward of the rolling surface at one end of the rod-shaped member. A first magnet is provided in the vicinity of the erection support surface. The first magnet has a first magnetic pole facing toward the one end of the rod-shaped member so that magnetic force from the first magnetic pole acts on the erection support surface. A

second magnet or a ferromagnetic material is provided in the vicinity of the erecting action surface. The second magnet has a second magnetic pole opposite in polarity to the first magnetic pole. The second magnetic pole faces  
5 upward so that magnetic force from the second magnetic pole acts on the erecting action surface. The rod-shaped member is constantly urged to pivot in the erecting direction by magnetic attraction force between the first magnetic pole of the first magnet and the second magnetic pole of the  
10 second magnet, or magnetic attraction force between the first magnetic pole of the first magnet and the ferromagnetic material, so that the rod-shaped member is automatically shiftable from the lying position to an erect position by rolling of the rolling surface on the erecting  
15 action surface. The lid of the container has an erection restraining part capable of holding the rod-shaped member in the lying position on the mount surface against the urging force acting on the rod-shaped member in the erecting direction when the lid is closed.

20 [0007] According to the first aspect of the present invention, the rolling surface is constantly subjected to urging force for pivoting the rod-shaped member in the erecting direction by magnetic attraction force between the first magnetic pole of the first magnet and the second  
25 magnetic pole of the second magnet, or magnetic attraction force between the first magnetic pole of the first magnet and the ferromagnetic material. When the lid is closed, the motion of the rod-shaped member urged to pivot in the

erecting direction by the urging force is restrained by  
abutment of the erection restraining part of the lid  
against the other end of the rod-shaped member. If the lid  
of the container is opened from this state, the rolling  
5 surface is caused to roll on the erecting action surface by  
the urging force, thereby allowing the rod-shaped member to  
shift from the lying position to the erect position  
automatically. Accordingly, it is easy for the user to  
hold and take the rod-shaped member out of the container.  
10 Further, because the rod-shaped member is held to the  
container by magnetic attraction force, there is minimum  
likelihood of the rod-shaped member dropping undesirably,  
which might otherwise occur owing to vibration or tilting  
of the container when the lid is opened.  
15 [0008] A second aspect of the present invention provides a  
self-erecting structure for a rod-shaped member including a  
rod-shaped member having a rod part with one end and the  
other end and an erecting operation part provided at the  
one end of the rod part. The self-erecting structure  
20 further includes a container having a mount surface capable  
of accommodating the rod-shaped member in a lying position.  
The mount surface has an erecting action surface for the  
erecting operation part of the rod-shaped member to perform  
an erecting action thereon. The container further has a  
25 lid capable of opening and closing an open part of the  
mount surface. The erecting operation part of the  
rod-shaped member has a rolling surface rollable on the  
erecting action surface in the erecting direction of the

rod-shaped member. An erection support surface is formed adjacent to and forward of the rolling surface at one end of the rod-shaped member. A ferromagnetic material is provided in the vicinity of the erection support surface.

5 A second magnet is provided in the vicinity of the erecting action surface so that magnetic force from the second magnet acts on the erecting action surface. The rod-shaped member is constantly urged to pivot in the erecting direction by magnetic attraction force between the  
10 ferromagnetic material and the second magnet so that the rod-shaped member is automatically shiftable from the lying position to an erect position by rolling of the rolling surface on the erecting action surface. The lid of the container has an erection restraining part capable of  
15 holding the rod-shaped member in the lying position on the mount surface against the urging force acting on the rod-shaped member in the erecting direction when the lid is closed.

[0009] The second aspect also offers the same operational  
20 advantages as those obtained by the first aspect.

[0010] In a self-erecting structure for a rod-shaped member according to a third aspect of the present invention, the erecting operation part of the rod-shaped member in the first or second aspect is formed from a spherical or  
25 ellipsoidal magnet. The magnet is disposed so that one of magnetic pole points at which the magnet has the highest magnetic flux density is positioned directly below the rod-shaped member when in the erect position as the first

magnetic pole of the first magnet. The rolling surface is defined by a curved surface around the magnetic pole point operating as the first magnetic pole. According to this aspect, the erecting operation part is spherical or  
5 ellipsoidal, and hence a curved surface extending over 360 degrees around the magnetic pole point constitutes the rolling surface. Therefore, when the rod-shaped member is to be accommodated on the mount surface, the user can place the rod-shaped member without the need to pay attention to  
10 the orientation thereof.

[0011] In a self-erecting structure for a rod-shaped member according to a fourth aspect of the present invention, the lid can open and close by pivoting around a pivot shaft. The erecting action surface is positioned on  
15 the mount surface closer to the pivot shaft of the lid. The pivoting direction of the rod-shaped member when shifting from the erect position to the lying position is the same as the pivoting direction of the lid from an open position to a closed position. According to this aspect,  
20 when the lid for the mount surface is to be closed, only slightly pivoting the lid downward allows the erection restraining part of the lid to abut on the other end of the rod-shaped member. Further pivoting the lid thereafter causes the rod-shaped member to pivot also in the same  
25 direction and to reach the lying position on the mount surface. Accordingly, the user need not touch the rod-shaped member so as to determine a direction in which it should pivot down, but can shift the rod-shaped member from

the erect position to the lying position simply by closing the lid with one hand.

[0012] In a self-erecting structure for a rod-shaped member according to a fifth aspect of the present invention, the erecting operation part is provided at one end of a cap. The cap has at the other end thereof an opening that fits to the shape of the one end of the rod part. According to this aspect, the erecting operation part need not be provided on the rod-shaped member in advance but can be provided on the cap, which is a separate member. Therefore, it is possible to produce the rod-shaped member and the cap separately from each other and to fit the cap to the rod-shaped member afterward. If the cap is produced to fit to an existing rod-shaped member, e.g. a makeup brush, the self-erecting structure according to the present invention can be post-installed on the existing rod-shaped member.

[0013] In a self-erecting structure for a rod-shaped member according to a sixth aspect of the present invention, the mount surface in the first and third to fifth aspects is arranged to be capable of accommodating a first rod-shaped member and a second rod-shaped member side-by-side and is formed with a first erecting action surface and a second erecting action surface for the first and second rod-shaped members, respectively. The first and second erecting action surfaces are spaced from each other to such an extent that when the erecting operation parts of the first and second rod-shaped members are positioned on the first and second erecting action surfaces, respectively,



the magnet of the first rod-shaped member and the magnet of the second rod-shaped member do not attract each other. If the two rod-shaped members are placed on the mount surface in a state where the magnet of the first rod-shaped member and the magnet of the second rod-shaped member are close in position to each other, the magnets of the two rod-shaped members may undesirably attract each other. In such a case, the above-described rod-shaped member self-erecting action may fail to take place. According to this aspect, the two erecting action surfaces are spaced from each other to such an extent that the magnets of the two rod-shaped members do not attract each other. Therefore, when the lid is opened, the rod-shaped members can erect independently without interfering with each other. Consequently, the user can smoothly take out either of two different kinds of rod-shaped members that is to be used without mistaking one for another.

[0014] In a self-erecting structure for a rod-shaped member according to a seventh aspect of the present invention, the first rod-shaped member and the second rod-shaped member in the sixth aspect are arranged to pivot toward each other when shifting from an erect position to a lying position. According to this aspect, the one end of each of the first and second rod-shaped members can be disposed at each end of the mount surface. Therefore, it is possible to minimize the space of the mount surface required for accommodating the two rod-shaped members.

[0015] An eighth aspect of the present invention provides

a self-erecting structure for a rod-shaped member including a rod-shaped member having a rod part with one end and the other end and an erecting operation part provided at the one end of the rod part. The self-erecting structure

5 further includes a container having a mount surface and a lid capable of opening and closing a surface facing the mount surface. The erecting operation part has a first magnet with a partial spherical or ellipsoidal surface. The first magnet is secured to the one end of the rod part

10 so that when the rod-shaped member erects, the magnetic pole of the partial spherical or ellipsoidal surface of the first magnet faces toward the mount surface. The mount surface has an erecting action surface for the rod-shaped member to perform an erecting action thereon. The mount

15 surface further has a second magnet that exerts magnetic force on the erecting action surface and its vicinity. The first magnet and the second magnet differ from each other in polarity of their respective magnetic poles facing each other when the rod-shaped member erects on the erecting

20 action surface. The rod-shaped member is constantly urged to pivot in the erecting direction by magnetic attraction force between the first magnet and the second magnet so that the rod-shaped member is automatically shiftable from a lying position to an erect position. When the lid is

25 opened, the rod-shaped member is erected by the urging force. When the lid is closed, the rod-shaped member can be held in the lying position in the container against the urging force.

[0016] According to this aspect, the rolling surface is constantly subjected to urging force for pivoting the rod-shaped member in the erecting direction by magnetic attraction force between the first magnet and the second magnet. When the lid is closed, the motion of the rod-shaped member urged to pivot in the erecting direction by the urging force is restrained by abutment of the erection restraining part of the lid against the other end of the rod-shaped member. If the lid of the container is opened from this state, the rolling surface is caused to roll on the erecting action surface by the urging force, thereby allowing the rod-shaped member to shift from the lying position to the erect position automatically. Accordingly, it is easy for the user to hold and take the rod-shaped member out of the container. Further, because the rod-shaped member is held to the container by magnetic attraction force, there is minimum likelihood of the rod-shaped member dropping undesirably, which might otherwise occur owing to vibration or tilting of the container when the lid is opened. In addition, because the erecting operation part has a partial spherical or ellipsoidal surface, a curved surface extending over 360 degrees around the magnetic pole point constitutes the rolling surface. Therefore, when the rod-shaped member is to be accommodated on the mount surface, the user can place the rod-shaped member without the need to pay attention to the orientation thereof.

[0017] A ninth aspect of the present invention provides a

rod-shaped member producing method that is a method of securing the above-described first magnet to one end of a rod-shaped member. The method includes the step of preparing a work surface having a magnetic pole opposite in polarity to a magnetic pole of the first magnet that faces the second magnet when the rod-shaped member erects on the erection support surface. The method further includes the step of placing the first magnet having a partial spherical or ellipsoidal surface on the work surface in a natural state, and the step of bringing the one end of the rod part into contact with the top of the first magnet placed on the work surface from directly above the first magnet, and bonding the first magnet to the one end of the rod part with an adhesive.

[0018] According to this aspect, when the first magnet is placed on the prepared work surface in a natural state, the magnetic pole of the first magnet that is in mutually attracting relation to the upward magnetic pole of the work surface faces downward by itself. In this state, one end of the rod part is brought into contact with the top of the first magnet and bonded thereto with an adhesive or the like. With this process, a rod-shaped member with the first magnet can be prepared easily.

[0019] In a self-erecting structure for a rod-shaped member according to a tenth aspect of the present invention, the lid in any of the first to third and fifth aspects is arranged to be capable of opening and closing by pivoting about a pivot shaft, and the erection support surface of

the rod-shaped member is flat. When the rod-shaped member is in the erect position with the erection support surface facing the erecting action surface, the rod-shaped member stands at a tilt to the pivot shaft of the lid. The rod-shaped member is shiftable from the erect position to the lying position on the mount surface by pivoting down toward the pivot shaft in linkage with the closing motion of the lid.

[0020] According to this aspect, when the lid is closed by pivoting it about the pivot shaft, the inner surface of the lid abuts on the distal end of the rod-shaped member and holds down the rod-shaped member from above. In this way, the rod-shaped member can be automatically shifted to the lying position on the mount surface.

[0021] In a self-erecting structure for a rod-shaped member according to an eleventh aspect of the present invention, the lid in any one of the first to third and fifth aspects is arranged to be capable of opening and closing by pivoting about a pivot shaft, and the erecting action surface is linearly slanted or curved so that when the rod-shaped member is in the erect position with the erection support surface facing the erecting action surface, the rod-shaped member stands at a tilt to the pivot shaft of the lid. The rod-shaped member is shiftable from the erect position to the lying position on the mount surface by pivoting down toward the pivot shaft in linkage with the closing motion of the lid.

[0022] According to this aspect, the erecting action

surface is slanted or curved. Therefore, when the rod-shaped member is in the erect position, it stands at a tilt to the pivot shaft of the lid. In this state, if the lid is closed by pivoting it about the pivot shaft, the inner surface of the lid abuts on the distal end of the rod-shaped member and holds down the rod-shaped member from above. In this way, the rod-shaped member can be automatically shifted to the lying position on the mount surface.

10 [0023] In a self-erecting structure for a rod-shaped member according to a twelfth aspect of the present invention, the lid in the seventh aspect is arranged to be capable of opening and closing by pivoting about a pivot shaft, and a pivoting guide surface is formed on the inner side of the lid, whereby when the lid is closed, the pivoting guide surface abuts on the distal ends of the first and second rod-shaped members and then guides the first and second rod-shaped members so that the rod-shaped members pivot toward each other.

20 [0024] According to this aspect, when the lid is closed by pivoting it about the pivot shaft, the pivoting guide surface abuts on the distal ends of the first and second rod-shaped members and pushes the first and second rod-shaped members to pivot toward each other. Accordingly, the closing operation of the lid enables the first and second rod-shaped members to be automatically shifted to the lying position on the mount surface.

[0025] In a self-erecting structure for a rod-shaped

member according to a thirteenth aspect of the present invention, the container in the first to twelfth aspects is a case body of a cosmetic compact case, and the rod-shaped member is a makeup brush or a makeup tip.

5 BEST MODE FOR CARRYING OUT THE INVENTION

[0026] Embodiments of the invention in this application will be described below with reference to the accompanying drawings. Fig. 1 is a perspective view showing the way in which a self-erecting structure for a rod-shaped member  
10 according to the present invention is applied to a cosmetic compact case 1. The cosmetic compact case 1 is mainly used by a woman to put on makeup when she is away from home or on other occasion. The cosmetic compact case 1 has a case body 3 corresponding to the container and a makeup brush 5  
15 corresponding to the rod-shaped member.

[0027] The case body 3 has a base 7 and a lid 11 connected to the base 7 pivotably about a pivot shaft 9. When in use, the lid 11 is pivoted through about 90 degrees as indicated by the arrow A in Fig. 1 to open the top side of the base 7,  
20 that is, an open part 8. When not in use, the lid 11 is pivoted in the direction indicated by the arrow B, and a latch piece 13 formed on the lid 11 is snap-fastened to a latch lock part 15 formed on the base 7, thereby enabling the lid 11 to be maintained in its closed position.

25 [0028] On the top of the base 7, a cosmetic pad 17 is provided closer to the pivot shaft 9, and a mount surface 19 is provided closer to the latch lock part 15 to accommodate the makeup brush 5. A mirror 21 is provided on

a side of the lid 11 that faces the top of the base 7. Incidentally, the cosmetic compact case 1 per se is conventionally known. It is also conventionally known that, by using the makeup brush 5, the user takes a cosmetic powder solidified in the cosmetic pad 17 into a brush part 29 of the makeup brush 5 and applies the cosmetic powder to the user's face.

[0029] The characteristic structure of the present invention will be explained below. The characteristic feature of the present invention resides in that when the lid 11 is opened, the makeup brush 5 accommodated on the mount surface 19 automatically erects as shown in Fig. 1. To explain the structure for automatically erecting the makeup brush 5 as stated above, two positions of the makeup brush 5 are defined and referred to in this specification as follows. When the makeup brush 5 is accommodated on the mount surface 19 substantially parallel thereto, the position of the makeup brush 5 will be referred to as the "lying position". When the makeup brush 5 stands up through pivoting from the lying position, this position will be referred to as the "erect position". It should be noted that the lying position does not necessarily mean a horizontal position. The erect position does not mean only an upright position of the makeup brush 5 reached by pivoting through 90 degrees from the lying position. The erect position is a concept including a state where the distal end of the rod-shaped member is raised off the mount surface 19 as a result of pivoting through an angle in the



range of 10 to 90 degrees, for example, from the lying position.

[0030] Cylindrical magnets 23 are provided under the mount surface 19 of the base 7 at the left and right ends, respectively, as viewed from the front. As shown in Figs. 2 and 3, the cylindrical magnets 23 are built in respective thick-walled portions of the base 7 under the mount surface 19. The cylindrical magnets 23 are disposed so that the N-pole 24 of each magnet 23 faces upward, i.e. toward the mount surface 19. In the present invention, a range of the mount surface 19 (shown by the two-dot chain line in Fig. 1) within which the N-pole of each cylindrical magnet 23 can magnetically attract the S-pole of another magnet or a ferromagnetic material is defined as an erecting action surface 25. This embodiment adopts an arrangement in which two cylindrical magnets 23 are provided at both ends, respectively, of the mount surface 19, and two erecting action surfaces 25 are formed in correspondence to the cylindrical magnets 23. The reason for this is to allow self-erection of the makeup brush 5 to take place no matter which direction (rightward or leftward) the makeup brush 5 faces when the user re-places it on the mount surface 19 after use. Therefore, if such a convenience need not be taken into consideration, the arrangement may be such that a cylindrical magnet 23 is provided at only one end of the mount surface 19. It should be noted that in this embodiment the cylindrical magnet 23 corresponds to the second magnet, and the N-pole

of the cylindrical magnet 23 corresponds to the second magnetic pole. The magnet corresponding to the second magnet may have any shape besides a cylindrical shape.

There is no restriction on the installation position of the magnet. The magnet may be provided at any position where  
5 magnetic force can substantially act on the erecting action surface, for example, on the mount surface, directly under the mount surface, or on the rear side of the case body 3.

[0031] The makeup brush 5 has a rod part 27 with one end  
10 and the other end. The brush part 29 is formed at the other end of the rod part 27. The makeup brush 5 further has a spherical magnet 31 corresponding to the first magnet. The spherical magnet 31 is bonded to one end of the rod part 27 by using an adhesive 33 so that the S-pole of the  
15 magnet 31 faces directly downward when the makeup brush 5 is in the erect position. It should be noted that the S-pole of the spherical magnet 31 corresponds to the first magnetic pole of the first magnet. The lower half of the spherical magnet 31 as viewed when the makeup brush 5 is in  
20 the erect position is formed from a hemispherical surface. Therefore, when the makeup brush 5 shifts from the lying position to the erect position, the hemispherical surface performs a rolling action. In the present invention, a surface that performs a rolling action when the makeup  
25 brush 5 shifts between the lying position and the erect position is referred to as a rolling surface 32. In this embodiment, the whole hemispherical surface at the lower half of the spherical magnet 31 as viewed when the makeup

brush 5 is in the erect position can function as a rolling surface.

[0032] Particularly, a portion of the spherical magnet 31 that contacts the erecting action surface 25 to support the  
5 makeup brush 5 when in the erect position, as shown in Fig. 1, is referred to as an "erection support surface 35" in the present invention. In this embodiment, the erection support surface 35 exists as a point in theory because the spherical magnet 31 is used. However, the erection support  
10 surface 35 may be flat if it is desired to make the erect position of the makeup brush 5 even more stabilized. In the present invention, the erection support surface 35 is located adjacent to and forward of the rolling surface 32 at one end of the makeup brush 5.

15 [0033] As stated above, the makeup brush 5 is urged to automatically pivot from the lying position to the erect position, that is, in the erecting direction, by the rolling action from the lying position to the erect position owing to the presence of the rolling surface 32  
20 and by the magnetic attraction of the spherical magnet 31 to the cylindrical magnet 23 that acts on the erecting action surface. It should be noted that in the present invention the part of the rod-shaped member where the above-described rolling action takes place and where  
25 magnetic attraction occurs between the spherical magnet 31 and the erecting action surface-side magnet is referred to as an "erection operation part 34".

[0034] The side of the lid 11 that faces the top of the

base 7, i.e. the side on which the mirror 21 is provided, is formed with an erection restraining part 37 extending over the top right-hand corner of the mirror 21 and its periphery, as shown by the one-dot chain line in Fig. 1.

5 The erection restraining part 37 is a surface that holds the makeup brush 5 in the lying position on the mount surface 19 against urging force acting on the makeup brush 5 in the erecting direction when the lid 11 is closed, as shown in Fig. 3(a).

10 [0035] The cosmetic compact case 1 has the above-described structure. The operation of the self-erecting structure for the rod-shaped member according to the present invention will be explained below in connection with the explanation of the cosmetic compact case 1 when in use.

15 [0036] When the cosmetic compact case 1 is not in use, as shown in Fig. 3(a), the lid 11 is pivoted to cover the open part 8 of the base 7 and placed in the closed position. At this time, the makeup brush 5 is in the lying position on the mount surface 19 with the erecting operation part 34 positioned on the erecting action surface 25. Moreover,  
20 the motion of the makeup brush 5 urged to automatically pivot in the erecting direction by the above-described rolling action and the magnetic attraction acting between the erecting operation part 34 and the erecting action  
25 surface-side magnet is restrained by the presence of the erection restraining part 37 of the lid 11.

[0037] If the user begins to open the lid 11 in this state, as shown in Fig. 3(b), the makeup brush 5 is released from

the restraint by the erection restraining part 37 and allowed to stand up in the erecting direction automatically.

[0038] If the lid 11 is pivoted through approximately 90 degrees to open, as shown in Figs. 3(c) and 2, the makeup  
5 brush 5 is erected substantially perpendicularly to the mount surface 19 by the above-described urging force acting on the makeup brush 5 in the erecting direction. At this time, the S-pole 36 of the spherical magnet 31 faces the N-pole 24 of the cylindrical magnet 23, so that the two  
10 magnets attract each other by each other's magnetic forces. Therefore, the makeup brush 5 is prevented from accidentally dropping off the mount surface 19 even if the makeup brush 5 is caused to swing, for example, by vibration of the lid 11 when opened, or by its erecting  
15 motion.

[0039] After the makeup brush 5 has reached the position as shown in Fig. 3(c), the user can easily hold it between his or her fingers. Therefore, the user can pick up the makeup brush 5 from the mount surface 19 and use it  
20 appropriately. After using the makeup brush 5, the user holds it down on the mount surface 19 with fingers and, in this state, pivots the lid 11 to the closed position. By doing so, the cosmetic compact case 1 can be returned to the not-in-use position as shown in Fig. 3(a). It should  
25 be noted that in this embodiment two erecting action surfaces 25 are formed at both ends of the mount surface 19, as has already been stated. Therefore, self-erection of the makeup brush 5 can take place no matter which direction

(rightward or leftward) the makeup brush 5 faces when it is placed on the mount surface 19.

[0040] Although one embodiment of the self-erecting structure for the rod-shaped member according to the present invention has been described above, the present invention is not necessarily limited thereto but can take various other forms as embodiments thereof. For example, the S-pole 36 of the spherical magnet 31 and the N-pole 24 of the cylindrical magnet 23 in the embodiment shown in Fig. 1 may be reversed to each other. Either the magnet provided under the mount surface 19 or the magnet for the erecting operation part 34 may be replaced with a ferromagnetic material. It should be noted that if the magnet provided under the mount surface 19 is replaced with a ferromagnetic material, a range of the mount surface 19 within which the erecting operation part 34 can be magnetically attracted to the ferromagnetic material by the action of the magnet for the erecting operation part 34 is defined as an erecting action surface 25.

[0041] As shown in Fig. 4(a), the erecting action surface 25 may be positioned at an end of the mount surface 19 closer to the pivot shaft 9. With this embodiment, the pivoting direction of the makeup brush 5 when it shifts from the erect position to the lying position is the same as the pivoting direction of the lid 11 when closed. Therefore, when the user begins to close the lid 11, the erection restraining part 37 of the lid 11 abuts on the makeup brush 5, causing the makeup brush 5 to pivot in the

same direction as the lid 11. Eventually, the makeup brush 5 reaches the lying position on the mount surface 19.

Accordingly, the user need not hold down the makeup brush 5 with fingers in order to determine the pivoting direction

5 when beginning to close the lid 11.

[0042] As shown in Fig. 4(b), a makeup brush 5a and a makeup tip 5B can be accommodated side-by-side. In this case, an erecting action surface 25a for the makeup brush 5a is provided at one end of the mount surface 19, and an  
10 erecting action surface 25b for the makeup tip 5B is installed at the other end of the mount surface 19. If the erecting action surfaces 25a and 25b are positioned away from each other in this way, the spherical magnet 31a of the makeup brush 5a and the spherical magnet 31b of the  
15 makeup tip 5B are not attracted to each other by each other's magnetic forces. Therefore, the makeup brush 5a and the makeup tip 5B are allowed to erect smoothly when the lid 11 is opened.

[0043] As shown in Fig. 4(c), the erecting action surface  
20 25 may be provided on a portion that pivots to stand up. It should be noted that in this embodiment a portion that pivots to open upward is referred to as "base 7", and a portion that remains in a horizontal position when the base 7 is pivoted is referred to as "lid 11", for sake of  
25 convenience. In this embodiment, a mount surface 19a and a mount surface 19b are formed on the left-hand side and the right-hand side, respectively, of the base 7, which pivots to stand up, as viewed from the front. The erecting action

surfaces 25a and 25b are formed at respective ends of the mount surfaces 19a and 19b closer to the latch piece 13.

Thus, the invention in this application includes an embodiment in which a mount surface and an erecting action surface are formed on a portion that pivots to open, and a rod-shaped member shifts from the lying position to the erect position on the portion that pivots to open.

[0044] As shown in Fig. 5, various configurations are conceivable with regard to the form of the erecting

operation part 34 provided at one end of the rod part 27.

As shown in Fig. 5(a), for example, the erecting operation part 34 may be formed from a magnet 38 having such a configuration that upper and lower surfaces thereof have a shape that forms a part of a spherical or ellipsoidal

surface, and the periphery of the magnet 38 between the upper and lower surfaces has a circular cylindrical shape. As shown in Fig. 5(b), the erection support surface 35 of the spherical magnet 31 may be flattened.

[0045] In another embodiment of the erecting operation

part 34 shown in Fig. 5(c), the spherical magnet 31 is replaced with a combination of a rolling direction limiting member 40 and a magnet 42. The rolling direction limiting member 40 is of an approximately sectorial shape in a side view and has a rolling surface 32 that is rollable only in one direction. The magnet 42 is provided in the lower end portion of the rolling direction limiting member 40 so that the S-pole of the magnet 42 faces downward. In this embodiment, the pivoting direction of the makeup brush 5



when it shifts from the lying position to the erect position is prespecified, and the orientation of the makeup brush 5 on the mount surface 19 is also prespecified.

[0046] In an embodiment shown in Fig. 5(d), the erecting operation part 34 is not previously provided at one end of the makeup brush 5 but prepared as a separate member in the form of a cap 39 that fits to the shape of the one end of the makeup brush 5. That is, a rolling surface 32 is formed at the lower end of the cap 39, and a magnet 43 is provided in the lower end portion of the cap 39 so that the S-pole of the magnet 43 faces downward. By fitting such a cap 39 onto one end of the makeup brush 5, an erecting operation part 34 is formed at the one end of the makeup brush 5. If the erecting operation part 34 is prepared in the form of a cap as stated above, an erecting operation part 34 can be readily incorporated to an existing makeup brush or other rod-shaped member simply by fitting the cap onto one end of the makeup brush or other rod-shaped member.

[0047] Although the self-erecting structure for the rod-shaped member according to the present invention has been described above with regard to the cosmetic compact case 1 as an example, the invention in this application is not necessarily limited thereto but applicable to various containers accommodating rod-shaped members. For example, the present invention may be applied to a pen case so that writing instruments accommodated therein stand up from the lying position to the erect position when the pen case is opened. The term "rod-shaped member" includes not only

makeup brushes but also various other articles that are easy for the user to hold when standing erect in the associated containers, such as writing instruments and toothbrushes. Further, although the lid 11 is pivotal in the embodiment shown in Fig. 1, it does not always need to be pivotal. The term "lid" includes various types, for example, a separable lid that allows the associated container to be opened simply by lifting the lid upward, and a horizontally pivotal lid that permits the container to be opened by pivoting the lid in the horizontal direction.

[0048] Next, a method of securing the spherical magnet 31 to one end of the makeup brush 5 in the embodiment shown in Fig. 1 will be described with reference to Fig. 6. In a case where the spherical magnet 31 is secured to the rod part 27 by using an adhesive or the like, it is difficult to determine the orientation of the spherical magnet 31 accurately with a method whereby the spherical magnet 31 and the rod part 27 are held with hands to bond them together with an adhesive or the like.

[0049] Therefore, according to the rod-shaped member producing method of the present invention, a workboard 41 is prepared as shown in Fig. 6(a). The workboard 41 has a magnet set so that a magnetic pole of the magnet that is opposite in polarity to the magnetic pole (S-pole in the embodiment shown in Fig. 1) of the makeup brush 5 that faces toward the erecting action surface 25 when the makeup brush 5 erects on the erection support surface 35, i.e. the

N-pole of the magnet, faces upward.

[0050] Next, as shown in Fig. 6(b), a spherical magnet 31 is placed on the workboard 41 in a natural state.

Consequently, the S-pole of the spherical magnet 31 is  
5 attracted to the N-pole of the workboard 41 and thus faces downward by itself. Then, as shown in Fig. 6(c), one end of the rod part 27 of the makeup brush 5 is brought into contact with the spherical magnet 31, which is in the above-described position, from directly above the spherical  
10 magnet 31, and bonded thereto with an adhesive 33. With this process, a makeup brush 5 with a spherical magnet 31 can be prepared easily.

[0051] Next, other embodiments of the present invention will be described with reference to Figs. 7 to 10. It  
15 should be noted that portions or members in Figs. 7 to 10 that are denoted by the same reference numerals as those in the drawings relating to the above-described embodiments are the same as those in the foregoing embodiments.

[0052] In an embodiment shown in Fig. 7, the makeup brush  
20 5 has a flat erection support surface 35. When the makeup brush 5 is in the erect position with the erection support surface 35 facing the associated erecting action surface 25, the makeup brush 5 stands at a tilt to the pivot shaft 9 of the lid 11. When the lid 11 is closed from a state where  
25 the makeup brush 5 is in the tilting erect position as shown in Fig. 7, the inner surface (mirror-side surface) of the lid 11 abuts on the brush part 29 of the makeup brush 5. Thereafter, as the lid 11 is further pivoted in the closing

direction, the makeup brush 5 gradually shifts from the erect position to the lying position in linkage with the closing motion of the lid 11. When the lid 11 is eventually closed, the makeup brush 5 is in the lying position on the mount surface 19. In this embodiment, the tilt angle of the makeup brush 5 when in the erect position needs to be an angle at which the makeup brush 5 can shift from the erect position to the lying position when the lid 11 is closed.

10 [0053] In an embodiment shown in Fig. 8, the erection support surface 35 of the makeup brush 5 is spherical. The erecting action surface 25 is linearly slanted so that when the makeup brush 5 is in the erect position with the erection support surface 35 facing the associated erecting  
15 action surface 25, the makeup brush 5 stands at a tilt to the pivot shaft 9 of the lid 11, as shown in Fig. 8. It should be noted that the erecting action surface 25 may be curved instead of being linearly slanted. With this arrangement, when the lid 11 is closed from a state where  
20 the makeup brush 5 is in the tilting erect position as shown in Fig. 8, the inner surface (mirror 21-side surface) of the lid 11 abuts on the brush part 29 of the makeup brush 5. Thereafter, as the lid 11 is further pivoted in the closing direction, the makeup brush 5 gradually shifts  
25 from the erect position to the lying position in linkage with the closing motion of the lid 11. When the lid 11 is eventually closed, the makeup brush 5 is in the lying position on the mount surface 19. In this embodiment also,

the tilt angle of the makeup brush 5 when in the erect position needs to be an angle at which the makeup brush 5 can shift from the erect position to the lying position when the lid 11 is closed. It should be noted that in this embodiment the erecting action surface 25 extends over from a horizontal surface to a linearly slanted surface, and the cylindrical magnet 23 is positioned under the vicinity of the border between the horizontal and slanted surfaces.

[0054] In an embodiment shown in Fig. 9, the erecting action surface 25 is slanted, and the associated cylindrical magnet 23 is installed parallel to the slanted erecting action surface 25. This embodiment also offers the same operational advantages as those obtained by the embodiment shown in Fig. 8.

[0055] In an embodiment shown in Fig. 10, two makeup brushes 5a and 5b are accommodated side-by-side. In this embodiment, as shown in Fig. 10(b), the lid 11 is pivotal about the pivot shaft 9. That is, the lid 11 is closed by pivoting it from an open position shown in Fig. 10(a) in the direction of the arrow shown in Fig. 10(b). The two makeup brushes 5a and 5b are juxtaposed along an imaginary line approximately parallel to the pivot shaft 9 of the lid 11. Pivoting guide surfaces 45 are formed on the inner side (mirror 21-side surface) of the lid 11 above the mirror 21. The pivoting guide surfaces 45 are curved so that their respective ends closer to the center of the lid 11 as viewed from the front are higher than the other portions of the pivoting guide surfaces 45.

[0056] When the lid 11 is closed, the pivoting guide surfaces 45 abut on the respective brush parts 29 of the two makeup brushes 5a and 5b standing erect and then guide the makeup brushes 5a and 5b so that the brushes 5a and 5b  
5 pivot toward each other as shown by the arrows 47. As shown in Fig. 10(b), the pivoting guide surfaces 45 are curved such that the end portion of each pivoting guide surface 45 that is remote from the pivot shaft 9 as seen in a side view extends downward more than the other portions  
10 thereof so that when the lid 11 is closed by pivoting it in the direction of the arrow shown in Fig. 10(b), the two makeup brushes 5a and 5b are restrained from pivoting leftward as viewed in Fig. 10(b).

[0057] With the above-described arrangement, when the lid  
15 11 is closed from a state where the makeup brushes 5a and 5b are in the erect position shown by the imaginary lines in Fig. 10(a), the inner surface (mirror 21-side surface) of the lid 11 abuts on the brush parts 29 of the makeup brushes 5a and 5b. Thereafter, as the lid 11 is further  
20 pivoted in the closing direction, the makeup brushes 5a and 5b gradually shift from the erect position to the lying position in linkage with the closing motion of the lid 11. When the lid 11 is eventually closed, the makeup brushes 5a and 5b are in the lying position on the mount surface 19.  
25 It should be noted that in this embodiment also the makeup brushes 5a and 5b may be arranged to stand at a tilt when in the erect position, as stated above in connection with Figs. 7 to 9.

BRIEF DESCRIPTION OF THE DRAWINGS:

[0058] [Fig. 1] Fig. 1 is a perspective view of an embodiment of a cosmetic compact case to which a self-erecting structure for a rod-shaped member according to the present invention is applied, showing the cosmetic compact case with the lid open.

[Fig. 2] Fig. 2 is a sectional side view of the cosmetic compact case to which the self-erecting structure for the rod-shaped member according to the present invention is applied, showing the cosmetic compact case with the lid open.

[Fig. 3] Fig. 3 is a sectional front view showing successive states of a makeup brush when the lid of the cosmetic compact case is opened.

[Fig. 4] Fig. 4 is a perspective view showing three other embodiments of the cosmetic compact case to which the self-erecting structure for the rod-shaped member according to the present invention is applied.

[Fig. 5] Fig. 5(a) is a perspective view showing another embodiment of a magnet provided at one end of a rod-shaped member; Fig. 5(b) is a side view showing an embodiment in which a magnet provided at one end of a rod-shaped member has a flat erection support surface; Fig. 5(c) is a perspective view showing another embodiment of an erecting operation part having a specified erecting direction; and Fig. 5(d) is a sectional side view showing an embodiment in which a cap-type erecting operation part is removably attached to one end of a rod-shaped member.

[Fig. 6] Fig. 6 is an explanatory view showing successive steps of securing a spherical magnet to one end of a rod part to prepare a rod-shaped member to be used in the self-erecting structure for the rod-shaped member according to the present invention.

[Fig. 7] Fig. 7 is a sectional side view showing a further embodiment of the cosmetic compact case to which the self-erecting structure for the rod-shaped member according to the present invention is applied.

10 [Fig. 8] Fig. 8 is a sectional side view showing a further embodiment of the cosmetic compact case to which the self-erecting structure for the rod-shaped member according to the present invention is applied.

15 [Fig. 9] Fig. 9 is a sectional side view showing a further embodiment of the cosmetic compact case to which the self-erecting structure for the rod-shaped member according to the present invention is applied.

[Fig. 10] Figs. 10(a) and 10(b) are a front view and a sectional side view, respectively, showing a further  
20 embodiment of the cosmetic compact case to which the self-erecting structure for the rod-shaped member according to the present invention is applied.

Explanation of Reference Numerals:

[0059] 1: cosmetic compact case

25 3: case body

5, 5a, 5b: makeup brush

7: base

8: open part



9: pivot shaft  
11: lid  
13: latch piece  
15: latch lock part  
5 17: cosmetic pad  
19: mount surface  
21: mirror  
23: cylindrical magnet  
24: N-pole of cylindrical magnet  
10 25, 25a, 25b: erecting action surface  
27: rod part  
29: brush part  
31, 31a, 31b: spherical magnet  
32: rolling surface  
15 33: adhesive  
34: erecting operation part  
35: erection support surface  
36: S-pole of spherical magnet  
37: erection restraining part  
20 38: magnet  
39: cap  
40: rolling direction limiting member  
41: workboard  
42: magnet  
25 43: magnet  
45: pivoting guide surface  
47: arrow